Warming U.S.-Soviet Relations During the Cold War as Measured by U.S. Presidential Statements: Impact of the Group Practice of the Transcendental Meditation-Sidhi Program

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SUMMARY

Currently, 25 empirical articles published in independent peer-reviewed journals or in scholarly conference proceedings have reported that the collective, or group, practice of the Transcendental Meditation and TM-Sidhi program enhances the societal quality of life and reduces violence, conflict, and war. The present study retrospectively investigated the impact of this program on U.S.-Soviet relations during the Cold War era, as reflected in public statements of U.S. President Ronald Regan concerning the U.S.S.R. Such statements are regarded as one of the most sensitive and relevant indicators of superpower relations.

All 478 pertinent statements published in the *Weekly Compilation of Presidential Documents* from January 1984 to December 1987 were content-analysed by two raters on a peace/war rating scale. Time series,

impact-assessment analyses established that the quartile distributions of the number of participants in the group practice of the Transcendental Meditation-Sidhi program had a significant relationship with the weekly average ratings of the presidential statements at lags 3, 5, and 8 ($p = .0005$), with positive total impacts (steady state gain) beyond the second and third quartiles. Weekly ratings totals showed significant impacts at lags 0 and 3 weeks ($p = .0018$), with a positive steady state gain when the number of participants was above the second or third quartiles.

Statistical assumptions of the analyses were satisfied and competing alternative explanations could not plausibly account for the findings. The results of the analyses also supported a causal interpretation. The findings of the current study thus lend support to the hypothesis that the U.S. president's statements about the U.S.S.R. would be significantly more positive and harmonious during and shortly following weeks when the number of group participants was larger.

INTRODUCTION

Before introducing the empirical study, we consider the relationship between the collective consciousness of a nation and the statements and actions of its head of state, as well as research findings on the effect of the collective practice of the Transcendental Meditation-Sidhi program in creating coherence in collective consciousness and its role in improving international relations and creating world peace.

Heads of State and Leadership. When a head of government speaks, everybody listens. The importance of every expression of a head of state lies in its range of influence—every speech or statement affects the outcome of large-scale affairs. It has historically been assumed that the role of a head of state is to represent his/her people, as well as actively lead and formulate the policies of the country (Hargrove, 1966). In international affairs, leadership is necessarily a complex issue. The network of channels of political communication between countries falls under the jurisdiction of the government, and important communications between nations are commonly expressed by the heads of state. Thus, statements of heads of state are of the utmost importance. In the case of Soviet and American relations, the heads of state have within their jurisdiction to make decisions as well, although it is recognized that the latitude of their decision-making power is restricted. During the period of this study, the international policies of the two superpowers had far-reaching effects and could ultimately have had an impact on every human being on earth. In

addition, the leaders of the U.S. and the U.S.S.R. each had within their reach a nuclear force capable of annihilating life on earth.

Creating world peace, on the other hand, should also be within the influence of heads of state. The methods to achieve peace have included political power, diplomatic missions, third party mediations, or the establishment of international organs such as the United Nations. The failure of traditional approaches to creating peace is evident from the more than 350 civil and international wars that have occurred since 1945, although the severity of war has decreased (Roser, n.d.).

It has become obvious to researchers of international relations that heads of state and governments have limited power in directing the destiny of their countries. Banks (1986), for example, had previously noted that the emerging paradigm suggests international relations are determined by interconnecting, interactive patterns of economics, ethnicity, ideology, and other transnational processes, in which governments only play *minor* roles.

It should be emphasised that neither war nor peace is the result only of the actions or intentions of the head of government. Political scientists agree that public opinion, or the attitudes held by people at large, does make an important difference in, for example, the "realm of nuclear confrontation and the production of risks thereof" (Smith, 1984, p. 466), and McConnel (1976) stated: "The quality of leadership is dependent upon the man who is president, but if the leader is to succeed it must be accepted by those who follow" (p. 85). The support of the people is vital not only directly, as in the election of an individual to become president, but also indirectly, by providing a basis for his/her power to make and implement decisions. Political scientists have in the past concluded that the extent to which a head of state, indeed even the government, can actively influence the destiny of a country is limited (Banks, 1986).

Head of State as the Reflection of Collective Consciousness. What is the relation between a people and its government? In the view of Maharishi Mahesh Yogi (1986a), widely regarded as the foremost scientist and teacher in the field of consciousness, the government of any country, irrespective of its political and economic system, is governed by the *collective consciousness* of the people. The government, with all its authority, is not an independent entity, but, no matter what the political system, is the 'innocent mirror' of the collective consciousness of its people, naturally reflecting whatever is presented to it.

> The absolute philosophy of government is that the government of any country, irrespective of its system—whether capitalist, communist, or any other system—is governed by the collective consciousness of the nation. Whatever the quality of national consciousness, that will always be the quality of national government and national law. (Maharishi, 1986a, p. 80)

Maharishi explains that it is the total sum of the consciousness of all individuals together that forms collective consciousness, and since national consciousness is the collective consciousness of all the individuals of the nation, it is ultimately the consciousness of the individual that is the prime mover of the nation and shapes its destiny. All individuals in the nation, whether they are aware of it or not, are directly responsible for the quality of government through their contribution to collective consciousness (Maharishi, 1977).

Although the leaders of each government have their own individuality and their own opinions about the nation's needs and its international relations, whenever they are engaged in the process of governing, their actions are determined by factors beyond their individual judgment (Maharishi, 1977). It may be said that they are *instruments* of the collective consciousness of the nation, whereas the real actor is the national consciousness. Maharishi (1986a) further explains that a peaceful, harmonious quality of international relations can only be achieved when the collective consciousness of the nation becomes integrated and coherent. If it is fragmented, problems dominate society, which will be reflected in a low quality of life, and poor international relations or even international conflicts. Maharishi (1986a) also suggests that improvement in the quality of the consciousness of the individual is the direct and most practical way to improve the performance and achievement of the government. Coherence on the individual level, he explains, is expressed in coherent individual thoughts and actions.

Coherent individuals behave in a most progressive or evolutionary way: they are of maximum benefit to themselves and to the environment, and form a coherent national consciousness, which is reflected, in the acts (and statements) of the head of state. The nation enjoys harmony and progress, and the international relations of an integrated, coherent nation improve steadily. Maharishi (1986a) adds, “Therefore, it is the national consciousness that has to be made more coherent. Every country has to rise to national integration.” He concludes: “Integrated national

consciousness will promote national life in the evolutionary direction, which means always positive and free from suffering" (p. 80).

Maharishi's Program to Create World Peace. In Maharishi's (1986a) view the creation of world peace requires increasing the coherence in the countries concerned, or even better, in the world consciousness as a whole. The lack of coherence in national consciousness leads to a loss of national integrity, insecurity, and to fear of one's neighbors. As a means to alleviate fear, a nation may resort to the build-up of arms to defend against the imagined enemy. However, Maharishi explains, "It is the inner enemy of violence, fear, and weakness in the nation itself that makes it amass the means of defense" (p. 139). He suggests how the nation can become strong: "It is the integrated national consciousness, the internal integrity of a nation, that upholds freedom in a country and makes the country really invincible" (p. 140). Azar and Burton (1986) provide a related analysis of the role of fear in the U.S.-Soviet relationship during the Cold-War era:

> There is the issue of mutual fear, and the related issue of preservation of identity. The fear each side has of the other is a fear for the internal survival of its own system. The hypothesis is that if there were more total security internally, there would be no fear of any external intentions or influences. (p. 119)

Maharishi (1978, pp. 258-261) explains that the internal integrity of a nation can be developed and maintained by increasing the coherence of collective consciousness. This will lead to the spontaneous and full unfoldment of local cultural values and the emergence and preservation of a political system most evolutionary to the country involved. In Maharishi's (1978) view, increased coherence in collective consciousness can easily be brought about due to the reciprocal relationship that exists between individual consciousness and collective consciousness. Every individual influences, and is in turn influenced by, the quality of every level of collective consciousness.

> As individual consciousness grows, collective consciousness rises; and as collective consciousness rises, individual consciousness grows. Individual consciousness is the basic unit of all levels of collective consciousness—family consciousness, community consciousness, national consciousness, and world consciousness—influencing them all and being in turn influenced by them. (p. 259)

Maharishi (1986b) further explains that incoherence in collective consciousness is caused by collective stress. Stress is generated in collective consciousness by individuals who become frustrated in, or have to struggle for, the fulfillment of their desires. Maharishi finds stress in collective consciousness to be the cause of disharmony in international relations, specifically relations between the U.S. and the Soviet Union.

> I attribute all the unfortunate trends of the superpowers in their policies of administration and international affairs to the fact that they are the victims of the stress in world consciousness. This stress is caused by the violation of natural law by the whole world's population. Why is that happening? Because nowhere is education dedicated to training the people to not violate the laws of nature. Education does not train the people to think and act spontaneously according to natural law. (p. 4)

Scientific research has indicated that through the practice of Transcendental Meditation and its advanced aspect, the Transcendental Meditation-Sidhi program, accumulated stress in the individual is dissolved, and future stress reduced and prevented, with wide-ranging benefits for mental and physical health and wellbeing and improved effectiveness in activity (e.g., Dillbeck, 2011; Dillbeck, Barnes, Schneider, Travis, & Walton, 2013).

Maharishi's Technologies of Consciousness. The Transcendental Meditation technique, brought to the West by Maharishi in 1959, is described as a simple, effortless, mental procedure practiced twice daily for 15-20 minutes, which involves no beliefs or specific lifestyle. The technique is said to naturally and spontaneously allow experience of quieter, more settled states of awareness until mental activity is transcended and one experiences pure consciousness, or pure awareness, in which consciousness is open only to itself without thoughts or perceptions (Maharishi, 1967/2011).

As the mind experiences this state of restful alertness during Transcendental Meditation, the body is said to experience deep rest, dissolving accumulated stress and fatigue, resulting in enlivenment of the latent creative potential of the individual and enhanced mental and physical wellbeing (Maharishi, 1963/2001). Benefits supported by research include, among others, better health (Orme-Johnson, 1987; Rainforth, Schneider, Nidich, Gaylord-King, Salerno, & Anderson, 2007; Schneider, Grim, Rainforth, Kotchen, Nidich, Gaylord-King … & Alexander,

2012), enhanced psychological development (Eppley, Abrams, & Shear, 1989; Gelderloos, 1987), improved intelligence (Kam-Tim & Orme-Johnson, 2001), and improved academic performance of students (Nidich, Mjasiri, Nidich, Rainforth, Grant, Valosek, Chang, & Zigler, 2011).

Research on brain activity during the practice of Transcendental Meditation indicates increased electroencephalographic (EEG) coherence, particularly in the frontal cortex area of the brain (Dillbeck & Bronson, 1981; Dillbeck & Orme-Johnson, 1987; Travis & Arenander, 2006). Randomised, controlled EEG research has identified longitudinal increases in a multivariate indicator of integrated brain functioning resulting from regular practice of the Transcendental Meditation technique (Travis, Haaga, Hagelin, Tanner, Arenander, Nidich … & Schneider, 2010), a pattern of brain functioning found in world-class performers in the fields of athletics, classical music performance, and business management (Harung & Travis, 2015). Research on brain functioning also supports the effortlessness of Transcendental Meditation and indicates how brain activity during the technique differs from other forms of meditation (Travis & Parim, 2017).

The Transcendental Meditation-Sidhi program, including Yogic Flying, was introduced by Maharishi in 1976. The purpose of this advanced program is described as accelerating the integration of pure consciousness experienced during the Transcendental Meditation technique with daily activity outside of meditation (Maharishi, 1986a). Practice of the Transcendental Meditation-Sidhi program is said to enhance the ability to think and act from the field of inner silence experienced during Transcendental Meditation, greatly enhancing mind-body coordination and thereby promoting greater effectiveness in activity (Maharishi, 1986a, pp. 29, 74-75). EEG coherence has also been found to increase during the Transcendental Meditation-Sidhi program (Orme-Johnson & Gelderloos, 1988; Orme-Johnson & Haynes, 1981). During the first stage of Yogic Flying the body is said to lift up and move forward in a series of short hops (Pearson, 2008), and global EEG coherence in brain activity is apparently maximised during Yogic Flying (Travis & Orme-Johnson, 1990).

EEG coherence observed as a result of the practice of the Transcendental Meditation and TM-Sidhi program is related to intelligence, creativity, physiological efficiency, and moral reasoning (Dillbeck, Orme-Johnson, & Wallace, 1981). Thus, practice of the Transcendental Meditation and/or TM-Sidhi program results in a more coherent or integrated individual consciousness.

Consciousness as a Field. It has been suggested that consciousness, like most fundamental processes in nature, is a field phenomenon (Hagelin, 1987). The ancient Vedic science of consciousness, as revived in its fullness by Maharishi as Maharishi Vedic Science, deals extensively with the nature of consciousness and holds that there exists an unmanifest field of *pure consciousness* underlying all subjective and objective creation (Maharishi, 1986a). Theoretical physicist John Hagelin (1987) proposes that this field of pure consciousness is identical to the unified field of force and matter fields postulated by quantum physicists. According to this view, at the scale of the unified field every aspect of nature becomes 'infinitely correlated' with each other, and an impulse at that level spreads automatically throughout the whole universe. The practice of the Transcendental Meditation and TM-Sidhi program is said to enliven pure consciousness, and thus generate non-localised field effects of coherence throughout the environment.

This understanding leads to a proposed practical solution to the problems facing the leaders of the world. Creating world peace, in Maharishi's view, starts with the individual. Because increase of coherence in collective consciousness can be brought about by increasing coherence in individual consciousness, Maharishi explains that peace and harmony on a global level can be reached by developing individual consciousness. *Maharishi's Program to Create World Peace* (Maharishi, 1986b; World Plan Executive Council, 1986), which was formally inaugurated in July 1986, aims to generate harmony and coherence in world consciousness through the collective practice of the Transcendental Meditation and TM-Sidhi program.

Evidence of the Field Effects of the Transcendental Meditation and TM-Sidhi Program. As early as 1960 Maharishi hypothesised that a small percentage of the population practicing the Transcendental Meditation technique would be sufficient to produce a positive influence on society as a whole (Katz, 2011). The first empirical support for this hypothesis came in 1974 when 1% of the population of several cities in the U.S. had begun the practice of Transcendental Meditation. Two sociologists at Maharishi International University (MIU) found that crime rate decreased in these cities compared to control cities, and they named the phenomenon the *Maharishi Effect*. This finding was subsequently replicated in a sample of 48 cities (Dillbeck, Landrith, & Orme-Johnson, 1981).

Dillbeck (1991), in a sample of cities in the Kansas City area, studied extensively alternative variables that have been found to covary with

crime figures, such as unemployment, poverty rate, income, educational level, size and density of the population, and age composition. The Transcendental Meditation technique had a significant effect even when the analyses controlled for the variance that could be accounted for by the alternative variables. In order to study the issue of causality more directly, the method of crossed-lagged panel correlation was employed on stratified random samples of 160 U.S. cities and 80 Standard Metropolitan Statistical Areas over five-year periods (Dillbeck, Banus, Polanzi, & Landrith, 1988). It was confirmed that an increasing percentage of Transcendental Meditation participants resulted in a decline in crime rate in the following years, providing evidence for a causal relationship.

The practice of the more advanced Transcendental Meditation-Sidhi program was predicted to have an even stronger sociological effect than the practice of the Transcendental Meditation technique alone (Maharishi, 1995, pp. 316-317). While practice of Transcendental Meditation involves experiencing progressively quieter states of the thinking process until the finest or quietest level of thought is transcended to reach pure awareness, in the Transcendental Meditation-Sidhi program specific thoughts are projected from the optimally coherent state of pure consciousness, which has strong developmental effects on the individual and the environment.

Collective, or group, practice of the Transcendental Meditation-Sidhi program, including Yogic Flying, is predicted to have an effect proportional to the effect of the square of individual practitioners according to the physical coherence principle of constructive interference, which states that the power or intensity of a field is proportional to the square of the amplitude of the field (Hagelin, 1987). The amplitude of a field can be increased by the coherent summation of amplitudes from different sources, thus the cumulative effect of the coherent elements is proportional to their number squared. According to this principle, the square root of 1% of the population participating in the collective practice of the Transcendental Meditation and TM-Sidhi program, including Yogic Flying, would have the same effect as 1% of the population practicing the Transcendental Meditation and/or TM-Sidhi program individually, an influence subsequently termed the *Extended Maharishi Effect*.

Numerous studies have supported this hypothesis. The requirement of the √1% of a population makes the Maharishi Effect amenable to quasi-experimentation since relatively small groups are needed to produce a large sociological effect. In the summer of 1978, a project was held in Rhode Island during which several small groups of Transcendental Meditation-Sidhi participants (total 300) resided in this state. A highly

significant improvement in the quality of life was found during this three-month period, as measured by crime rate, auto accidents and fatalities, death due to other causes, cigarette and alcohol consumption, unemployment, and air pollution. Box-Tiao (1975) impact-assessment modeling based on autoregressive integrated moving averages (ARIMA) time series analysis was used to evaluate effects of the group practice and control for naturally occurring cycles (Dillbeck, Cavanaugh, Orme-Johnson, & Mittlefehldt, 1987).

The improvements in these eight quality-of-life indicators were relative to those of the control state of Delaware, thereby excluding regional or national trends as alternative explanations of these changes. This article also reported similar impact-assessment studies in India, Puerto Rico, and the Philippines, all of which found significant reductions in crime and other improvements in quality of life during periods in which there was the required number of participants in the collective practice of the Transcendental Meditation and TM-Sidhi program, after controlling for weekly, monthly, and seasonal cycles and other alternative explanations (Dillbeck et al., 1987).

In 1979 a permanent group of Transcendental Meditation-Sidhi participants was established at MIU in Fairfield, Iowa, with the purpose of enhancing U.S. quality of life and improving the international situation. A 25-year study on the effect of this permanent group of participants in the Transcendental Meditation and TM-Sidhi program found a dramatic improvement in the quality of life in the U.S. as measured by a composite index of 11 social indicators (Orme-Johnson, Gelderloos, & Dillbeck, 2011). This effect was evident once the combined influence of the Transcendental Meditation participants throughout the U.S. and Transcendental Meditation-Sidhi group at MIU exceeded the 1% threshold in 1983. Structural equation modeling supported a causal interpretation.

The impact of the MIU group on a violence index composed of weekly totals of fatalities due to motor-vehicle accidents, homicide, and suicide was analysed in two subsequent studies. When the Yogic Flying group was large enough to have a theoretically predicted effect on the U.S. during 1982-1985, as well as on both Canada and the U.S. in 1983-1985, transfer function (TF) analysis and Box-Tiao impact analysis found statistically significant decreases in violence in both countries (Assimakis & Dillbeck, 1995; Dillbeck, 1990). A significant leading impact of the MIU group on decreases in the violence index in both the U.S. and Canada, with no significant evidence of a leading influence of the index on group participation, was found using TF analysis (Box & Jenkins, 1976; Liu, 2009).

A prospective, quasi-experiment from 7 June to 30 July 1993 examined the impact of a temporary assembly in Washington, D.C. of 4,000 Yogic Flyers on weekly totals of homicide, rape, and assault (HRA) (Hagelin, Rainforth, Orme-Johnson, Cavanaugh, Alexander, Shatkin, … Ross, 1999). The research hypotheses and study protocol were lodged in advance with an advisory board of independent scientists and leading citizens. TF analysis found a highly significant maximum drop of 23.3% in HRA crimes during the last week of the assembly when the group size was largest. The analysis controlled for weather variables (including temperature), daylight hours, police staffing, and pre-existing trends and seasonal cycles.

More recently two prospective quasi-experiments examined the impact of the MIU group during 2007-2010 on monthly rates of U.S. homicide, as well as rates of murder and violent crime in 206 large urban areas (Cavanaugh & Dillbeck, 2017a; Dillbeck & Cavanaugh, 2016). (MIU was renamed Maharishi University of Management [MUM] in 1995). During these four years, the size of the Transcendental Meditation-Sidhi group consistently exceeded or approached the √1% of the U.S. population (approximately 1,725 at that time). The impact analysis employed a broken-trend (or segmented-trend) time series regression model and reported a highly significant decrease in trend for each of the three violence rates beginning in January 2007 when the group size first exceeded the √1% threshold. Relative to the baseline mean for each series, the reduction in linear trend resulted in a decline of 21.2% in the U.S. homicide rate, a 28.4% drop in the urban murder rate, and an 18.5% decline in the urban violent crime rate. The studies estimate that the practical significance of this phenomenon (i.e., the reduced trend) resulted in prevention of 8,157 U.S. homicides and 186,774 urban violent crimes.

The observed drop in violence rates could not be plausibly explained by changes in demographic factors, economic conditions, incarceration rates, policing strategies, surveillance technology, temperature, seasonal effects, pre-existing trends, or spurious regression effects due to nonstationarity. Additional studies examining the same time period and employing the same research design reported significant reductions in trend for monthly fatality rates due to drug-related death, infant mortality, motor-vehicle accidents, and other accidents (Cavanaugh & Dillbeck, 2017b; Dillbeck & Cavanaugh, 2017). More detailed discussion of these studies can be found in Orme-Johnson and Fergusson (2018) and Dillbeck and Cavanaugh (2016).

Feasibility of Maharishi's Program to Create World Peace. Several quasi-experimental, impact-assessment studies examining the

peace-creating influence of the Transcendental Meditation and TM-Sidhi program have been conducted in various locations experiencing civil strife and international conflicts. In 1978 teams of TM-Sidhi participants were sent to conflict areas in Central America, Southern Africa, the Middle East, Iran, and South-East Asia with the purpose of calming down the violence. They did not engage in any public activity but practiced the Transcendental Meditation and TM-Sidhi program in groups in their hotels.

A Box-Tiao impact analysis of the coded data from the Conflict and Peace Data Bank, an independent daily data bank that collects from over 70 major public sources (Azar, 1980), showed that the conflict situations improved significantly in the five trouble spots during the experimental period in comparison to the previous ten years and to the world as a whole (Orme-Johnson et al., 2011). In addition, there was a significant improvement in international relations globally as indicated by a significant decrease of hostile acts and verbal hostilities and an increase of cooperative events, measured by the weekly time series of 1978 relative to the weekly averages of the previous ten years employing ARIMA impact assessment.

In a prospective study in 1981 in the war-torn Lebanese village of Baskinta, a complete cessation of hostilities was observed from the time 1% of its population began to practice the Transcendental Meditation technique (Abou Nader, Alexander, & Davies, 2011). The number of incoming shells, property damage, and casualties dropped significantly after the 1% level was reached, in abrupt contrast with the previous trend and to neighboring towns where an increase of hostilities was observed.

Another study in the Middle East examining the impact of the collective practice of the Transcendental Meditation-Sidhi program was conducted in August and September 1983. Predictions of the outcomes of the study were lodged in advance with scientists in the U.S. and Israel. The effects of the various group sizes, categorised by quartiles, on the quality of life in Jerusalem, where the assembly was held, and Israel as a whole, as well as on the war violence in Lebanon, were studied with Box-Tiao impact analyses and TF analyses (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, 1988). The range of influence was directly proportional to the group size: Relatively smaller groups had an effect on Jerusalem and Israel, while when the group size rose above the third quartile, a significant influence on the Lebanese war was found, as indicated by fewer war casualties and decreased intensity of war as studied by content analysis using a scale similar to Azar's COPDAB Peace/War Index (Azar, 1980). Cross-correlations and transfer function analysis supported the

hypothesis that the Transcendental Meditation-Sidhi group was the cause of these changes. In response to critiques of their research (Fales & Markovsky, 1997; Schrodt, 1990), the authors published follow-up studies that supported their original findings (Orme-Johnson, Alexander, & Davies, 1990; Orme-Johnson & Oates, 2009).

Subsequently, a series of World Peace Assemblies (WPAs) with several thousand Transcendental Meditation-Sidhi participants were held in Fairfield, Iowa, Washington, D.C., and the Netherlands. Some of these WPAs were large enough to create a peace-creating influence for the world's population, known as the *Global Maharishi Effect*. Davies and Alexander (2005) studied the effects of large WPAs as well as smaller, local assemblies on the Lebanon war over a 27-month period. These studies assessed the impact of seven temporary assemblies of Transcendental Meditation-Sidhi participants, each of which was sufficiently large enough to have a theoretically predicted effect on the Lebanese war according to the √1% principle (Davies & Alexander, 2005). The assemblies were held between June 1983 and August 1985 either in Lebanon, Israel, Yugoslavia, the U.S. (three large assemblies), and the Netherlands. Daily events data from international news sources were coded by a Lebanese coder who was unaware of either the research hypotheses or the peace-creating technology employed.

Box-Tiao (1975) impact-assessment analysis found that, compared to the 728 nonexperimental days, during the 93 days when the assemblies were large enough to have the predicted effect on the Lebanese conflict, there was a highly statistically significant 48% mean reduction in the level of conflict, a 71% reduction in war fatalities, a 66% increase in cooperation among the warring parties, and an improvement in a composite Peace/War index. The analysis controlled for the influence of temperature, religious holidays, weekends, trends, drifts, and seasonal patterns. The impact-assessment research design with multiple replications employed in this study (and other related research, including the current study) is regarded as a powerful quasi-experimental design for causal inference (Cook & Campbell, 1979, p. 222).

A significant effect of three large WPAs was found on fatalities and injuries due to international terrorism as well as on content-analysed news reports on international conflict (Orme-Johnson, Dillbeck, & Alexander, 2003). Each assembly, ranging from 8-11 days held during 1983-1985, approached or exceeded the √1% of the world's population, a level sufficient to have a predicted global effect of reduced conflict and violence. For this study, daily terrorism counts from the RAND corporation database

were aggregated into five-day periods to form a single time series (TS). Date-blind coding of events reported in *The New York Times* and *The Times of London* was used to create a similar daily TS of international conflict data. Box-Tiao (1975) impact analysis found a significant 72% drop in fatalities and injuries due to international terrorism and a 32% decline in international conflict during the assemblies. The results of this study on the Global Maharishi Effect could not be explained by seasonal effects of pre-existing trends, drifts, or correlation patterns in both data series.

Research on U.S.-Soviet Relations and the Maharishi Effect. The impact of the group practice of the Transcendental Meditation and TM-Sidhi program on U.S.-Soviet relations 1979 to 1986 was analysed by Gelderloos, Cavanaugh, and Davies (1990, 2011) using simultaneous TF analysis (Liu, 2009). They used an independent source of monthly, content-analysed events data from the Zurich Project on East-West Relations. To estimate possibly nonlinear impacts of the group, binary impact-assessment variables representing quartiles of the group size were included in each TF equation.

The impact-assessment analysis found a significant improvement in U.S. actions toward the U.S.S.R., during or shortly following months in which the average group size was in the range 1,500–1,700, thus exceeding the predicted √1% critical threshold for the U.S. (approximately 1,500 at the time). On the four occasions when the number of participants in the group practice at assemblies was greater than the size of the group at MIU, the attendance figures for the assemblies were included in the calculation of monthly average group size: in Amherst, Massachusetts; twice in Washington, D.C.; and in The Hague, the Netherlands. Group sizes greater than the third quartile (1,700) in this study were associated with even greater improvement in U.S. behavior internationally. During and after months in which the average daily number of participants was 1,700 or more, and controlling for U.S. actions toward the U.S.S.R., a sizeable and significant improvement in Soviet actions toward the U.S. was found, a finding of relevance to the present study.

This analysis of Gelderloos, Cavanaugh, and Davies (1990, 2011) was later extended by Cavanaugh, Gelderloos, and Dillbeck (2018). Using TF analysis, they examined the effect on Soviet behavior toward the U.S. during four temporary WPAs held in 1983-1986 when the number of participants approached or exceeded the √1% of the world's population (Cavanaugh & Gelderloos, 2011; Cavanaugh, Gelderloos, & Dillbeck, 2018). The WPAs were held 27 December 1983 to 6 January 1984 (8,000 participants in Fairfield, Iowa); 1-13 July 1984 (5,100 participants in

Fairfield, Iowa); 28 December 1984 to 6 January 1985 (6,100 participants in The Hague, Holland); and 8-17 July 1985 (5,500 participants in Washington, D.C.). These Assemblies can be considered a prospective quasi-experiment (Cook & Campbell, 1979) in international conflict resolution because their publicly announced purpose was a reduction of global stress and tension for the purpose of generating greater peace and harmony in international relations, especially in superpower relations.

The TF model included a binary impact-assessment variable to measure the influence of the Assemblies. During and shortly following the WPAs, a highly significant improvement in Soviet behavior toward the U.S. was found. The total impact of these Assemblies was larger than that reported by Gelderloos, Cavanaugh, and Davies (1990, 2011) for group sizes over 1,700. The reported findings were both practically and statistically significant. Diagnostic tests and sensitivity analysis indicated that the impact of the Assemblies could not be explained by the impact of Mikhail Gorbachev, pre-existing trends, seasonal or other cycles in Soviet behavior, or spurious regression.

The Current Study on U.S.-Soviet Relations. In the present retrospective study, we investigated the impact of the collective practice of the Transcendental Meditation and TM-Sidhi program, including Yogic Flying, on a protracted international conflict with worldwide implications: the U.S.-Soviet relationship during the Cold War era. For more than four decades after World War II the two superpowers co-existed in an atmosphere of extreme suspicion and mistrust, and at several times were indirectly engaged in hostile activities against each other.

From the perspective of Maharishi's theory of collective consciousness, with a sufficiently large increase of coherence in the national consciousness of the U.S., it could be expected that the U.S. would show a more harmonious and conciliatory attitude toward its enemies. The fluctuations in coherence of collective consciousness of the U.S. can best be measured by fluctuations in the size of the number of participants in the collective practice of the Transcendental Meditation and TM-Sidhi program at MIU, the largest Transcendental Meditation-Sidhi group in North America. Thus, the size of the MIU group has been employed as the independent, or exogenous, variable in this study.

The current research is an updated and expanded version of a previous impact-assessment study that examined the effect of the collective practice of the Transcendental Meditation and TM-Sidhi program at MIU on improved U.S.-Soviet relations as reflected in public statements about the U.S.S.R. made by the president of the U.S. (Gelderloos,

Frid, & Xue, 1989). The statements of President Ronald Reagan were used as indicators of the quality of U.S.-Soviet relations, because the president is the channel of all significant international communications, and because the head of state, it can be proposed, represents and reflects the collective consciousness of the nation.

The quality of presidential statements on the relationship between the two superpowers was predicted to be more positive and harmonious with increased coherence in U.S. national consciousness, and thus the average weekly quality ratings were analysed as a dependent, or endogenous, variable. Because not only the average quality of the presidential statements but also the frequency with which they are expressed were significant in U.S.-Soviet relations, the most important dependent variable consisted of the overall weekly summaries, or total weekly quality ratings of presidential statements. Thus, the total weekly sum of quality ratings for all individual presidential statements on U.S.-Soviet relations formed the second, and most comprehensive, endogenous time series variable.

METHOD

A content analysis was performed on President Reagan's public statements from January 1984 to December 1987, when the number of participants in the collective Transcendental Meditation-Sidhi practice at MIU was large enough to have the predicted influence on U.S. international relations. This period was also long enough to perform reliable time-series analyses.

During the mid- to late-1980s, statements of the U.S. President were published by the Office of the Federal Register of the National Archives and Records Administration as the *Weekly Compilation of Presidential Documents.* The documents were dated and arranged in chronological order. A 'presidential week' begins on Saturday and ends on Friday. In the current study, the following categories were used: speeches, statements, interviews, proclamations, radio addresses, and other addresses and remarks. All documents referenced in the Weekly Compilation as *Union of Soviet Socialist Republics—General Secretary* or *Union of Soviet Socialist Republics—relations with U.S.* were photocopied. The copies were given random numbers and all dates (as well as references to dates in the text) were removed. Longer speeches or interviews were divided into shorter sections with a maximum length of two pages. In most cases, questions by press reporters or comments by others than the president himself were taken out of the documents, except in cases were the president's answer

was ambiguous without them. A total of 478 statements were prepared in this way.

For purposes of content analysis, a scale was adapted from the International Peace/War Scale from the Conflict and Peace Data Bank (Azar, 1980), which was thought to be appropriate for the rating of developments in the U.S.-Soviet relationship. The scale ranges from –7 to +7 with specific descriptions at every level, where –7 stands for extensive war acts; 0 for neutral, routine or non-significant actions or statements; and +7 for harmony, agreement, and unification. Two raters, male psychology students from Sweden and the People's Republic of China, were trained in the content-analysis procedure. Both countries were considered neutral and had fair or good relations with both the United States and the Soviet Union, and both raters evaluated themselves to be 'objective' in their attitudes towards the politics of the U.S. and Soviet Union.

Content analysis was conducted in the following way: The raters alternately read a statement aloud to each other and individually scored it according to the Peace/War Scale on the scoring sheets. The inter-rater reliability of these 478 ratings was $r = .77$ $(p < .0001)$ which is considered adequate. In the case of disagreement between raters, which was defined as a score difference greater than one point, a discussion between the two raters would follow until one or both raters adjusted the score(s) to yield a maximum of one-point difference. This procedure was followed to ensure that both raters understood the full implication of the statements to be rated, and thus contribute to the objectivity and generalizability of the analysis. Such adjustments occurred in eight percent of the ratings (76 cases out of 956), indicating a high level of overall agreement between the two raters. For each statement, an average score was compiled from the two ratings. These ratings were then converted into weekly averages (203 values), which formed the weekly average quality, the first endogenous series. The average ratings were for the weeks ending 6 January 1984 through 20 November 1987. The weekly rating totals were calculated by summing the ratings of the individual statements per week.

According to the theoretical model, a 'phase transition' toward more coherence would be generated in the nation when the √1% of the population participates in the collective practice of the Transcendental Meditation-Sidhi program. For the U.S. that critical threshold for 1984 to 1987 was approximately 1,560. However, it could be theorised that to produce improved relationships between two nations, relatively more coherence would be required than to improve the quality of life in one

country alone, although it would be difficult to establish a precise critical threshold for this theory. Prior to 1990 the Transcendental Meditation program had not been taught in the Soviet Union, thus the required coherence for improved relations between the superpowers needed to be generated by the U.S. alone. Therefore, we took an empirical approach of studying the impact of different group sizes, categorised according to the quartiles of the group size distribution. The weekly averages of participation in the collective Transcendental Meditation-Sidhi practice at the afternoon sessions for the period from January 1984 to December 1987 were used as the explanatory variable. On the two occasions when the size of the group at MIU was exceeded by the number of participants in the collective practice in Washington, D.C., due to a conference being held there, the latter number was used instead.

Box-Tiao impact-assessment analysis (Box & Tiao, 1975) was used to test the hypothesis that a sufficiently large group of participants in the Transcendental Meditation-Sidhi program at MIU would have a positive effect on the statements of the president concerning U.S.-Soviet relations. To allow for uncertainty about the appropriate critical threshold and possible nonlinearities in the relation between group size and the dependent variables, an empirical approach was used which compared the ratings of the president's statements of weeks categorised according to the average size of the attendance at the collective practice at MIU. We used a method similar to the one used by Cavanaugh (1987) and Orme-Johnson et al. (1988) for assessment of the influence of the group practice of the Transcendental Meditation-Sidhi program on the economic 'misery index' in the U.S. and Canada, and the quality of life in Israel. This impact-assessment approach employed three binary (0-1) intervention variables to represent weeks in which the average size of the group of Transcendental Meditation-Sidhi participants fell within specific ranges defined by quartiles of the group size.

Specifically, the weeks when the group size fell between the first and second quartile, the second and third quartile, and beyond the third quartile were compared with the weeks with an average size below the first quartile. In this way, the differential impacts of the different group sizes beyond the first quartile were estimated with reference to the impact on the ratings of presidential statements for groups below the first quartile. This served as a conservative test because the size of the MIU group was consistently large during the studied period, frequently exceeding the predicted national threshold of 1,560 participants. This would yield a high baseline level, and thus the differential effect would be deflated.

In this impact-assessment analysis, which is a special case of transfer function analysis, three binary indicator or 'pulse' variables of 0's and l's served as the input series. The first binary series took the value of zero except in the cases where the average weekly group size fell between the first and second quartiles (1,659 to 1,754 participants); the second binary series took the value of one when the group size fell between the second and third quartiles (1,755 to 1,860 participants); and the third binary series took the value of one when the group size was beyond the third quartile (1,861 participants or greater).

The general approach of the Linear Transfer Function (LTF) method was used, which employs three steps in the iterative process of identification of the impact-assessment model in the case of multiple-input transfer functions (Liu, 2009; Liu & Hudak, 2004):

1. Estimation of the impulse response weights for each input up to 10 lags;
2. Determination of the form of the transfer function that best approximates the pattern of the impulse response weights; and
3. Determination of the form of the noise model for the dependent variable.

Initial estimates of the impulse response weights were based on maximum likelihood estimates of the following equation (Liu, 2009; Liu & Hudak, 2004):

$$Y_t = C + V_1(\mathrm{B})I_{1t} + V_2(\mathrm{B})I_{2t} + V_3(\mathrm{B})I_{3t} + N_t$$

where V_i (B) represents the impulse response weights, B is the backshift operator, I_{it} represents the binary (0-1) impact-assessment variables, C is a regression constant term, and N_t is a stationary Box-Jenkins autoregressive moving average (ARMA) stochastic noise component to be modeled. Estimates of the noise component and impact-assessment model were obtained by employing an approximation to the likelihood function as implemented in SCA time series software (Hilmer & Tiao, 1979; Liu & Hudak, 2004).

The LTF approach was modified by use of the Akaike information criteria (AIC) to provide an objective criterion in model identification (Akaike, 1972, 1973; Larimore, 1983). The choice between plausible alternative models was based on the minimization of the AIC. This criterion is defined as:

$$\text{AIC} = -2 \log_e (\text{maximum likelihood}) + 2k$$

where k is the number of parameters estimated. The same number of effective observations was used in the AIC calculations to allow precise comparisons across model structures. Use of the AIC in model selection has a strong theoretical foundation in information theory and entropy. It can be shown (Anderson, 2008, p. 57) that the fitted model with minimum AIC minimises the averaged (expected) information lost (Kullback-Leibler information) when the selected model is used to approximate the unknown 'true' model. Information in this context refers to knowledge of model structure and relations between variables while 'non-information' or entropy is purely random noise, or 'white noise', in the data.

RESULTS

Weekly Average Quality. The noise component for the first endogenous series (weekly average quality) that minimised the AIC had an autoregressive (AR) structure (Box & Jenkins, 1976) with AR components at lags 2 and 17 weeks. This noise model can be represented as follows:

$$N_t = \phi_1 z_{t-2} - \phi_2 z_{t-17}$$

where ϕ_1 and ϕ_2 stands for the autoregressive parameters. All the parameter estimates of the AR model were statistically significant (Table 1). All roots of the AR polynomials lay outside the unit circle, confirming the stationarity of the estimated noise model (Box & Jenkins, 1976).

The three binary impact-assessment variables were distributed approximately randomly throughout the studied period, without a trend or other systematic pattern over time. None of the impulse response weights of the first binary variable (between first and second quartile) was significant, hence these binary values were collapsed with the baseline, expanding the baseline to include all weekly average group sizes below the median. The value of the constant, representing the average score of the presidential ratings during the baseline period, was .720 indicating that there was an overall tendency toward positive presidential statements concerning the U.S.S.R. during this period. The second binary variable (between 2nd and 3rd quartile) had an impulse response weight of .466 three weeks later ($t(177) = 2.42$, $p = .0165$), a negative impulse response eight of –.639 after five weeks ($t(177) = -3.44$, $p = .0007$) and an impulse response weight of .387 at a lag of eight weeks ($t(177) = 2.12$, $p = .0354$).

The sum of the three impulse response weights yields a steady state gain value of .194, where the steady state gain is the cumulative total impact of a sustained MIU group size between the second and third quartiles. This steady state gain represents an increase of 26.9% in weekly average ratings relative to the baseline level. The third binary variable (beyond the 3rd quartile) had a highly significant positive impulse response weight of .842 points at three weeks ($t(177) = 4.28$, $p < .0001$), and a significant negative effect at a five-week lag of –.607 points ($t(177) = -3.11$, $p < .0022$), with a steady state gain of .234. Relative to the baseline level, the steady state gain represents an increase of 32.5% in weekly average ratings. The impulse weights for the second and third impact-assessment variables are given in Table 1. The steady state gains are charted in Figure 1.

Table 1: Impact-assessment model estimates for average weekly quality ratings of presidential statements.

Parameter		Variable	Parameter Type	Lag	Parameter Estimate	Standard Error	*t* Value	*p* Value
1	C		Const.	0	0.7201	0.1084	6.64	.0000
2	ω_{23}	I_2	Num.	3	0.4456	0.1838	2.42	.0165
3	ω_{25}	I_2	Num.	5	-0.6390	0.1859	-3.44	.0007
4	ω_{28}	I_2	Num.	8	0.3874	0.1824	2.12	.0354
5	ω_{33}	I_3	Num.	3	0.8420	0.1969	4.28	.0001
6	ω_{35}	I_3	Num.	5	-0.6074	0.1955	-3.11	.0022
7	ϕ_2	Y	AR	2	0.1747	0.0746	2.34	.0204
8	ϕ_{17}	Y	AR	17	-0.2296	0.0789	-2.91	.0041

Residual Sum of Squares	164.282
R-Square	0.142
Effective Number of Observations	178
Residual Standard Error	0.961
Ljung-Box *Q* Statistic (10 *df*)	11.3
Likelihood Ratio Statistic (5 *df*)	21.902
AIC	508.867

Note: Estimation is by maximum likelihood; Const. = constant term; Num. = numerator parameter (impulse response weight); AR = autoregressive noise parameter.

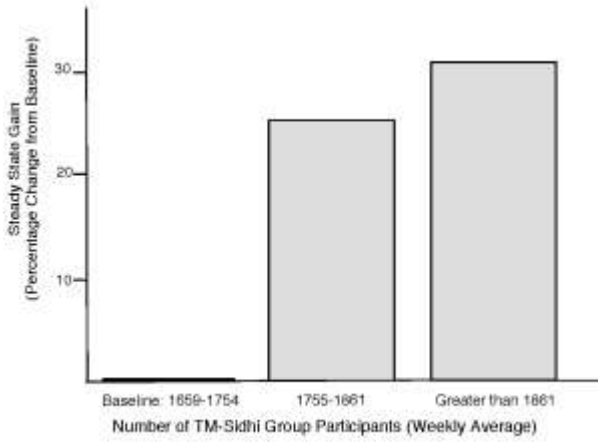

Figure 1: Percentage increase from baseline in average weekly quality ratings of presidential statements for weeks with TM-Sidhi group size above median, averaging 1,755-1,861 and greater than 1,861, respectively.

A test for the joint significance of the impact-assessment parameter estimates is given by a likelihood ratio test (Nelson, 1976) based on the following formula:

$$\lambda = N \log_e (SSE_C/SSE)$$

where N represents the effective number of observations, SSE_C the residual sum of squares for the constrained model (without binary variables), and SSE the residual sum of squares for the impact-assessment model. The test statistic λ for large N follows approximately the Chi-square distribution, with the number of degrees of freedom equal to the number of parameters constrained to zero under the null hypothesis of no effect of the TM-Sidhi group. The likelihood ratio test is highly significant: $\lambda = 21.902$ *(df* = 4, *p* = .0005), indicating a significant effect of the collective practice of the Transcendental Meditation-Sidhi program on the quality of President Reagan's statements on the U.S.-Soviet relationship.

The AIC estimate of the final impact-assessment model was 508.867, which was the lowest of several alternative model structures (including noise and binary variable alternatives). In addition, diagnostic tests on the model residuals were satisfactory, with no significant autocorrelations for lags 1 to 12 *(Q* = 11.3, *df* = 10), 24 (*Q* = 16.7, *df* = 22) and 36 *(Q* = 20.9, *df* = 34) as indicated by the Ljung-Box Q statistic (Ljung & Box, 1978). An ARMA (0, 0) structure was indicated by the extended autocorrelation function of

the residuals (Liu, 2009) suggesting white noise, and the histogram and plot of the residuals indicated approximate normality.

Additionally, when the size of the Transcendental Meditation-Sidhi group at MIU was above the median, the natural logarithm of the number of presidential statements increased significantly ($t(198) = 2.70$, $p = .0075$). The resulting increase of 42.1% in the number of statements perhaps indicated that the president was more concerned with addressing important global issues when national consciousness was more coherent.

Weekly Ratings Totals. Weekly summaries of the total quality ratings for presidential statements were computed by multiplying the quantity of statements each week times the average quality ratings for the week. To make this endogenous variable stationary, it had to be log transformed to stabilise the variance. Because the weekly totals for some weeks were zero, the constant 5.0 was added to the weekly totals before log transformation. The noise component for the natural logarithm of this series that minimised the AIC had an AR structure with autoregressive components at lags one and two. This noise model can be represented as follows:

$$N_t = \phi_1 \mathrm{z}_{t-1} - \phi_2 \mathrm{z}_{t-2}$$

Both AR parameter estimates were statistically significant (see Table 2), and the roots of the AR polynomials lay outside the unit circle, confirming stationarity. Again, no impulse response weights were significant between the first and second quartile, thus all values below the median were collapsed into the baseline.

The second binary variable had a significant contemporaneous impulse response weight of .209 ($t(197) = 2.35$, $p = .0198$), signifying an improvement in the weekly total quality ratings for presidential statements. A second significant impulse response weight of .224 was found at lag three ($t(197) = 2.49$, $p = .0136$). The third binary variable (above the third quartile) also had a significant impulse response weight at lags zero and three weeks of .190 and .300, respectively ($t(197) = 1.98$, $p = .0491$; $t(197) = 3.17$, $p = .0018$).

The steady state gain of the second binary variable was .433, which represents a 54.1% improvement in the weekly total ratings as calculated using the following formula that translates impulse response weights of log transformed data into percentage changes of the raw metric (McLeary & Hay, 1980): Percentage change = $(e^{\omega} - 1)100$.

The steady state gain for the third binary impact assessment variable was larger (.490), representing an improvement of 63.2%. These findings are represented in Table 2 and Figure 2. The likelihood ratio test was highly significant $\lambda = 17.20$ *(df* = 4, *p* = .0018), indicating a significant effect of the collective practice of the Transcendental Meditation and TM-Sidhi program on the total weekly quality ratings for presidential statements on the U.S.-Soviet relationship.

Table 2: Impact-assessment model estimates for average weekly quality ratings of presidential statements based on natural logarithm of weekly total ratings.

Parameter		Variable	Parameter Type	Lag	Parameter Estimate	Standard Error	*t* Value	*p* Value
1	C		Const.	0	1.7295	0.0704	24.56	.0000
2	ω_{20}	I_2	Num.	0	0.2085	0.0889	2.35	.0198
3	ω_{23}	I_2	Num.	3	0.2240	0.0899	2.49	.0136
4	ω_{30}	I_3	Num.	0	0.1902	0.0959	1.98	.0491
5	ω_{33}	I_3	Num.	3	0.2997	0.0944	3.17	.0018
6	ϕ_1	Y	AR	1	0.2401	0.0694	3.46	.0007
7	ϕ_3	Y	AR	2	0.2307	0.0703	3.28	.0012

Residual Sum of Squares	34.761
R-Square	0.228
Effective Number of Observations	198
Residual Standard Error	0.419
Ljung-Box *Q* Statistic (10 *df*)	10.1
Likelihood Ratio Statistic (5 *df*)	17.198
AIC	233.426

Note: Estimation is by maximum likelihood; Const. = constant term; Num. = numerator parameter (impulse response weight); AR = autoregressive noise parameter.

The AIC estimate of the impact assessment model was 233.426, which was the lowest of several alternative model structures (including noise and binary variable alternatives). Diagnostic tests on the model residuals showed no significant autocorrelations for lags 1 to 12 *(Q* = 10.1, *df* = 10), 24 *(Q* = 25.0, *df* = 22) and 36 *(Q* = 35.5, *df* = 34), as indicated by the Ljung-Box Q statistic.

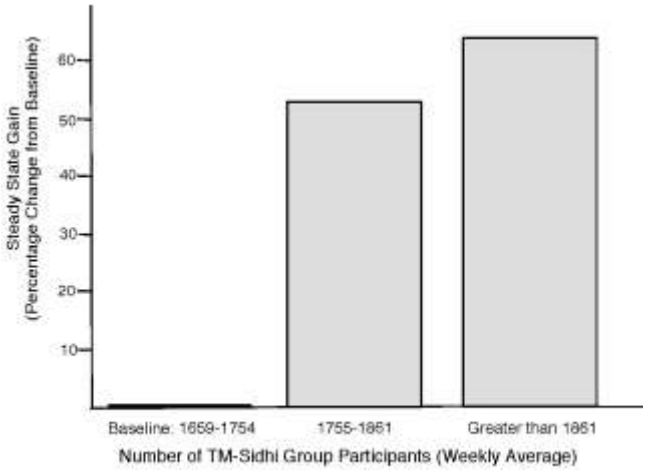

Figure 2: Percentage increase from baseline in total weekly quality ratings of presidential statements for weeks with TM-Sidhi group size above median, averaging 1,755-1,861 and greater than 1,861, respectively.

An ARMA (0,0) structure was indicated by for the extended autocorrelation function of the residuals, suggesting white noise, and the histogram and plot of the residuals appeared to be approximately normally distributed.

DISCUSSION

The outcomes reported above are consistent with the hypothesis that, during the period of this study, a sufficiently large number of participants in the collective practice of the Transcendental Meditation and TM-Sidhi program, including Yogic Flying, positively influenced U.S.-Soviet relations, as indicated by an increase in the weekly total and weekly average quality of presidential statements with respect to the U.S.S.R. When the weekly average size of the group exceeded the median, a substantial positive differential effect was observed with respect to the weekly average and weekly total quality ratings of the statements as compared to the impact of a TM-Sidhi group size below the median.

The positive and negative impulse response weights of the weekly average quality ratings of presidential statements in response to enhanced coherence in collective consciousness may represent the oscillation of the nature of the U.S.-Soviet relationship system as well as the fluctuation of the number of participants in the Yogic Flying group. With increased

coherence, more positive statements were expressed after three weeks, followed by some slightly negative evaluations at a five-week lag. The steady state gain was positive for both the second and third binary variables, signifying an ultimate positive impact if these group sizes were to be maintained. The finding that the steady state gain for the third binary variable was larger than the gain for the second impact-assessment variable is in accordance with the hypothesis that a more positive effect should be observed when more coherence is generated.

The most comprehensive outcome variable is the weekly total quality ratings for all relevant presidential statements. When the average group size during a particular week was above the median, a significant contemporaneous effect was found, followed by an even stronger significant positive effect three weeks later. The lagged pattern and the fact that the steady state gain of the third impact-assessment variable (63.2%) was substantially larger than that for the second impact-assessment variable (54.1%) (indicating a 'dose effect') suggests a causal relationship.

In general, the lagged pattern at zero and three weeks can possibly be understood as follows: It falls within the president's jurisdiction to make immediate changes in tone and emphasis in his speeches and addresses, or to make decisions on minor issues, which thus will occur immediately; however, substantial policy and administrative changes will have to be evaluated and implemented by his staff apparatus, a process that may take several weeks.

The major alternative explanation to be considered is that the increase in positivity in President Reagan's public statements is a reflection of an increased openness and conciliation from the Soviet's side, rather than a result of increased coherence in the United States. Especially, the innovative leadership of General Secretary Gorbachev has been widely praised in this respect by political observers. However, as we noted in our introduction, from the perspective of Maharishi's theory of government, government leaders should be perceived as the instruments of the collective consciousness, rather than initiators of new developments. According to this point of view, Gorbachev was merely reflecting a newly emerging quality of Soviet collective consciousness. In fact, this trend of renovation started previously with Andropov, who skillfully appointed potential 'reformers' to critical positions (Tucker, 1987).

In addition, the distribution of the binary impact-assessment variables was approximately random throughout the four-year period, and the fluctuations of the dependent variable were significantly influenced by the changing number of participants in the collective Transcendental

Meditation and TM-Sidhi practice at MIU. By contrast, Gorbachev's presence and apparent impact was constant over the studied period. There were no indications of a constantly improving trend in Reagan's statements, although even intermittent improvements of relations accumulate in the long run into a permanently better mutual understanding and concrete achievements of enhanced cooperation.

Finally, it has to be understood that, according to Maharishi's theory, the collective consciousnesses of various nations are highly interconnected; when coherence substantially increases in one country, there is more coherence in world consciousness as a whole, reflecting back on all countries in the world. Thus, from the perspective of Maharishi's theory of collective consciousness, it is possible that the structural changes taking place in the Soviet Union at the time of this study were an effect of the increased coherence in world consciousness resulting from the influence of the large permanent group in the U.S., several large assemblies of Yogic Flyers in the U.S. and Holland that were big enough to have a predicted global effect, the cumulative impact of the steady growth over time in the number of people learning the Transcendental Meditation and TM-Sidhi program worldwide, and the large permanent group in India established by Maharishi in 1986 as part of his program to create world peace (discussed below).

Also, Maharishi (1978) explains that increased coherence and harmony even in national consciousness alone will inspire more cordial relations with other nations: "When there is harmony within the country, even enemies want to become friends and the leaders receive only smiles and praise from everywhere. Relations are cordial" (pp. 105-106). In 1989 Maharishi described how the effect of increased coherence in U.S. national consciousness had been influencing collective consciousness in the U.S.S.R. by means of enlivening the unified field at the basis of both U.S. and Soviet national consciousness:

> I congratulate the Golden Domes of MIU, where thousands have been engaged in creating that coherence in the whole world consciousness. That is the advantage of the unified field—it is one common basis of all diversity. Any little enlivenment of it anywhere is enlivenment in all space and time, in the whole universe, everywhere.
>
> There has been a lot of enlivenment of the unified field in the U.S., and none in Russia—on the surface level. But from underneath, the

> unified field of America is no different from the unified field of Russia. Therefore, Russians, and people throughout the world, are as powerfully influenced as Americans. (cited by Pearson, 2008, p. 361)

Remarkably a significant differential impact of the MIU group on President Reagan's statements was observed only in the weeks with more than 1,755 participants in the collective practice at MIU, substantially more than the 1,560 participants minimally required to create noticeable effects for the U.S. alone. One possible explanation for this is that Maharishi often emphasised the need for a 'safety factor' and explained that in some cases groups larger than the √1% of the population may be required to create sufficient coherence to prevent or reduce conflict and violence, especially in situations of intense stress and tension in collective consciousness (e.g., Maharishi, 1986a, p. 82).

In view of the prior 40-year history of heightened tension, fear, and conflict in Cold-War relations between the U.S. and Soviet Union, born of intense stress in collective consciousness, it seems reasonable from the theoretical perspective examined in the current study, to expect that increases in the coherence of U.S. national consciousness greater than that created by a Transcendental Meditation-Sidhi group consisting of only the √1% of the U.S. population might be required to create a substantial softening of U.S. presidential statements regarding the U.S.S.R.

In sum, the outcomes of the current study are consistent with Maharishi's theory of collective consciousness. Although causality cannot be definitively established in quasi-experimental research on social systems, the time series, impact-assessment research design used in the current study is characterised by potentially high internal validity for causal inferences when randomised, controlled experiments are not feasible (Campbell & Stanley, 1966; Cook & Campbell, 2002; Shadish, Cook, & Campbell, 1979, p. 222). The lagged pattern of the effects suggests that improvements in U.S.-Soviet relations were led in time by the number of participants in the collective practice of the Transcendental Meditation and TM-Sidhi program at MIU, supporting a causal interpretation. In addition, the fact that significant impacts were observed, while the distribution of the impact-assessment variables was approximately random throughout the studied period, strengthens the case for a causal relationship. Finally, the finding of a "dose effect," i.e., that the impact was stronger in the case of larger groups of Yogic Flyers (group size beyond the

third quartile as compared to groups between second and third quartiles), also lends support to the causality hypothesis.

The empirical results reported above could not be plausibly explained by pre-existing trends, seasonal or other cycles in the data, spurious regression results due to nonstationarity, or the postulated impact of Mr. Gorbachev on President Reagan's statements regarding the U.S.S.R. All assumptions of the statistical analyses were satisfied, supporting statistical conclusion validity.

Thus, the current study contributes to the accumulation of published scientific evidence that lends empirical support to the Maharishi Effect hypothesis, which predicts that increased coherence in the collective consciousness of a population will result in improved harmony in international relations, improved societal quality of life as measured by decreased crime and violence, reduced traffic and other accidental fatalities, and other social indicators.

Progress in U.S.-Soviet Relations After 1987. As discussed below, the ratings of the presidential statements during the 1984-1987 period examined in the current study were well in accord with the substantial and concrete improvements in U.S.-Soviet interactions over the years 1988-1991 following this study. This lends support to the validity of the ratings of the presidential statements as indicators of U.S.-Soviet relations.

The changes that took place in 1988 with respect to the relationship between the two superpowers were of an unprecedented nature, as expressed in a front-page article in *The Des Moines Register* under the heading: "U.S., Soviet military moves may signal a turning point." The article begins:

> The United States and the Soviet Union are pulling back from confrontation around the world in what could be the most profound and dramatic change in their relationship since World War II. Military budgets on both sides are leveling off or being trimmed. Weapons are being removed. Military forces are being withdrawn. Bases may be closed. (Des Moines Register, 1988, p. 1)

As noted in the Introduction, Maharishi (1986a, pp. 139-140) views the accumulation of armaments as the expression of fear and lack of integrity of national consciousness, a theory voiced by peace researchers as well (Azar & Burton, 1986, p. 119). In addition, Maharishi predicted that increased coherence in world consciousness would enhance the national integrity of all nations and make large build-up of weapons obsolete. An

expression of this perspective was given at the Communist Party conference in the summer of 1988 in Moscow. Mr. Gorbachev criticised his predecessors for favoring military over political strategies in dealing with the West. Such thinking, he noted, was 'historically obsolescent' (Cullen, 1988).

The developments towards reduced military budgets by the major military powers (the U.S.S.R., U.S., and China), declines in worldwide arms sales, and proposals for significant cuts in the troops and weaponry in Europe were further expressions of this trend. At their summit meeting in Washington, D.C., on 8 December 1987, Reagan and Gorbachev signed the Intermediate Nuclear Forces (INF) treaty, pledging additional future arms reductions. At the Moscow summit in June 1988, U.S. and Soviet leaders signed additional agreements for arms control and peaceful uses of outer space.

During the period of this study, in both the U.S. and the Soviet Union there were signs that the 'expansionist's' approach to national security policy was being questioned (Azar & Burton, 1986). Azar and Burton suggest that the expansionist strategy is ultimately based on fear of system failure. Again, when national integrity is enhanced, expansionism is not necessary for system preservation.

Political observers note that the most significant effect of improved U.S.-Soviet relations may have been the sudden development towards peace of numerous protracted conflicts around the world (Goldstein, 2011, p.16). Without the military, economic, and political backing of the superpowers, countries throughout the world suddenly lacked support to continue fighting even if they desired to.

By the middle of 1988, progress toward peace was observed in the following conflicts:

— The eight-year-old Iran-Iraq war came to an end in August 1988, ending the world's longest ongoing major armed conflict;
— Vietnam withdrew its general staff from Kampuchea and agreed to pull out its troops from Kampuchea and Laos by the end of 1989;
— Cuba, Angola, and South Africa agreed to end the longstanding Angola and Namibia conflicts, Cuba announced it would withdraw all its 500,000 troops from Angola by mid-1991, and in May South-Africa withdrew from Namibia and ended its 73-year rule there;

- Morocco and Algeria renewed diplomatic relations in May, and settlement over the 13-year-old Western Sahara conflict was reached by the end of 1988;
- In May 1988, Qadaffi declared an end to Libya's 20-year long dispute with Chad;
- The president of Uganda signed a peace agreement with his last rebel opponents, ending 20 years of violence; and
- North Korea suggested new talks on a non-aggression pact with South Korea.

Other key developments in U.S.-Soviet relations during 1988 included the following:

- On 15 May the Soviet Union began pulling out of Afghanistan;
- Reagan and Gorbachev meet at the Moscow Summit 29 May-1 June and ratified the Intermediate Nuclear Forces Treaty;
- During the Moscow summit Reagan was asked whether he still regarded the U.S.S.R. as "the Evil Empire." He responded, "No, I was talking about another time and another era" (Service, 2015, p. 299); and
- In a speech to the UN General Assembly on 7 December, Gorbachev declared that the Soviet Union would no longer militarily interfere with Eastern Europe.

In 1989 the momentum accelerated toward improved U.S.-Soviet relations and increased global peace:

- Soviet troops completed their withdrawal from Afghanistan on 2 February;
- Following large, peaceful pro-reform demonstrations on 9 and 16 October, the East German Government opened the Berlin Wall on 9 November, and this iconic symbol of East-West confrontation for 45 years, fell shortly thereafter;
- Gorbachev in Helsinki on 25 October proclaimed the "Sinatra Doctrine" stating that the U.S.S.R. would allow East European satellite states to "do it their way," opening the door to the reform of hardline governments in Eastern Europe;
- During the Malta Summit in December, Gorbachev privately pledged to avoid violence in the former Soviet satellites of Eastern Europe, while U.S. President George H.W. Bush secretly

promised not to create problems for the U.S.S.R. in that region (Beschloss & Talbott, 1993, p. 164);
- At the end of the Malta Summit, Gorbachev and Bush declared that a long-lasting era of peace had begun, marking what many political observers regard as the official beginning of the end of the Cold War (Woodrow Wilson Center, 1989);
- At the invitation of the Soviet government, 35,000 people in Armenia were taught Transcendental Meditation by a delegation from MIU, the first public teaching of the TM technique in the U.S.S.R.; and
- Gorbachev in his 1990 New Year's address proclaimed 1989 as the "Year of Ending the Cold War" (Pearson, 2008, p. 353).

Progress toward peace continued in 1990 and 1991:

- Starting in February 1990, 150,000 people were taught Transcendental Meditation in Russia, Ukraine, and other parts of the U.S.S.R. at the invitation of the Soviet government;
- In September 1990, at the Helsinki Summit, Gorbachev and Bush issued a joint declaration condemning the August 1990 Iraqi invasion of Kuwait;
- After 45 years of division, East and West Germany were peacefully reunified on 3 October;
- The treaty on Conventional Forces in Europe was signed by NATO and Warsaw Pact leaders on 19 November;
- On 28 February 1991, Kuwait was liberated, and the Gulf War ended;
- In July the Warsaw Pact, the largest standing army in world history (12 million soldiers), was formally dissolved;
- On 31 July 1991, Bush and Gorbachev signed the Strategic Arms Reduction Treaty (START) to reduce and limit strategic offensive arms and announced their co-sponsorship of a Middle East peace conference; and
- On 25 December Gorbachev resigned as president of the U.S.S.R and on 28 December the U.S.S.R. was formally dissolved.

Sources of Coherence in Collective Consciousness, 1988-1991. In the years 1988-1991, immediately following the 1984-1987 period analysed in the current study, the Maharishi Effect hypothesis suggests that the progress toward improved U.S.-Soviet relations and global peace discussed

above continued to be supported by the coherence generated in U.S. and world consciousness by the large permanent group of Transcendental Meditation-Sidhi participants in the U.S. Also, as described in Pearson (2008, pp. 335-371), some of the major breakthrough events in the progressive unfoldment of greater global harmony and peace occurred during, or shortly following, large WPAs at MIU. For example, an assembly 1-15 October 1989 attended by 4,000 participants, the largest such WPA since July 1985, was followed by Gorbachev's historic proclamation of the "Sinatra doctrine" on 25 October and the stunning and unexpected fall of the Berlin Wall on 9 November 1989.

An additional major source of increased coherence in world consciousness during and following the 1984-1987 period of the current study was provided by a large permanent group of Yogic Flyers in India organised by Maharishi beginning in 1986 as a key aspect of *Maharishi's Program to Create World Peace* (Maharishi, 1986c; World Plan Executive Council, 1986). The group consisted of young Vedic experts (Maharishi Vedic Pandits) who, in addition to their daily collective practice of Yogic Flying, each day performed up to three traditional Vedic performances, or Maha Yagyas, for the declared purpose of reducing global conflict and violence and promoting world peace (Pearson, 2008, pp. 368-369).

By fall 1989 the India Pandit group at Maharishi Nagar outside New Delhi increased from approximately 1,800 Yogic Flyers (3,200 total Pandits) in January 1989 to more than 2,500 Yogic Flyers (3,800 Pandits). In 1990, the group in India reached nearly 4,000 Yogic Flyers (5,000 Pandits total); in 1991 the group increased to 6,400 Yogic Flyers (6,900 Pandits), and by mid-1992, the India group included more than 7,500 Yogic Flyers (7,900 Pandits).

Maharishi's theory of collective consciousness implies that the increased coherence in world consciousness generated by the India group, together with the coherence produced by the permanent group of Yogic Flyers at MIU, including yearly periodic large temporary WPAs, powerfully contributed to the dramatic transformation of superpower relations and improved global peace during the mid-1980s through the early 1990s. Empirical testing of the impact of these groups during 1988-1992 remains a potentially fruitful topic for future research.

CONCLUSION

The theory and empirical evidence presented in this article are consistent with the hypothesis that rising coherence in collective consciousness

brought about by the collective practice of the Transcendental Meditation-Sidhi program significantly contributed to improved U.S.-Soviet relations during 1984 through 1987, as indicated by more harmonious statements about the U.S.S.R. by the president of the U.S. From this perspective, the improvement in superpower relations during the period of this study may be viewed as setting the stage for the events of 1988-1991 that culminated in the end of the Cold War, including the unexpected and dramatic fall of the Berlin Wall, the collapse of the vast Soviet empire in Eastern and Southeastern Europe with scarcely a shot being fired, the peaceful dissolution of the Warsaw Pact (the largest standing army in recorded history), and the end of numerous proxy conflicts between the superpowers in many regions of the world.

No political observers or U.S. and Soviet government leaders seemed to have anticipated the astonishing and sudden end to the dangerous 45-year confrontation between the U.S. and U.S.S.R. As noted by historian Robert Service (2015), "No Western or Soviet politician had expected the Cold War to end in their working lifetimes. Everything took place as if in a dream that unfolded with unexpected twists in the plot before people woke up to what had occurred" (p. 497). President Reagan himself seemed astonished and mystified by the sudden warming in superpower relations. At the Moscow summit in June 1988, Reagan declared to reporters: "There is no way I really can explain how I came to be here. I never expected to be here" (Sidey, 1988, p. 13). While no foreign policy experts or government leaders foresaw the end of the Cold War, the peaceful ending of the dangerous rivalry between the superpowers fulfilled a primary, declared aim of Maharishi's Program to Create World Peace initiated by Maharishi in July 1986 (Maharishi, 1986c; World Plan Executive Council, 1986).

In inaugurating his Year of World Peace in January 1987, Maharishi defined three criteria of success in achieving world peace: (1) the end of enmity between the superpowers, (2) the end of the prolonged, deadly war between Iraq and Iran, and (3) a significant decline in international terrorism (Pearson, 2008, p. 348). The first criterion was fulfilled by the ending of the Cold War. The second of these aims was achieved with the end of the Iraq-Iran war in August 1988, a conflict that had cost 650,000 lives (Goldstein, 2011, p. 16). The final goal was fulfilled by a declining trend in deaths due to international terrorism, a trend that continued through 1991 (Enders & Sandler, 2012, p. 74).

Fast forwarding to 2018, despite recent progress in creating large groups of experts in the Transcendental Meditation-Sidhi program, especially in the military and schools in several countries of Latin America,

a key aspect of Maharishi's Program to Create World Peace remains unfilled as of this writing: establishment of at least one permanent group of at least 10,000 Yogic Flying Vedic Pandits in India, which Maharishi declared to be necessary in order to create a sufficiently powerful influence of coherence in world consciousness and thereby provide a firm foundation for lasting global peace.

The results of the current study, plus those of 19 peer-reviewed empirical articles published in independent scholarly journals and six other studies published in scholarly conference proceedings, offer strong empirical support for the impact of Maharishi's approach to creating peace. Maharishi's consciousness-based approach seeks to create peace through peaceful means from the level of the unified field, neutralizing the perceived fundamental cause of war and violence—stress and tension in world consciousness—by generating coherence in collective consciousness through practitioner groups of sufficient size. Because the estimated cost of permanently establishing a group of 10,000 is said to be on the order of $1 billion, less than one half the $2.2 billion cost of one B-2 bomber, government leaders worldwide have little to lose and much to potentially gain by implementing this scientifically validated approach to reducing violence and creating peace.

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